

REMARKS

In accordance with the foregoing, claims 2-3, 10-13, 16-20, and 29 have been amended and new claims 30-31 have been added. Claims 1-4 and 7-31 are pending, with claim 1 being independent. No new matter is presented in this Amendment.

Amendment After Final Rejection of February 7, 2006, Is Not To Be Entered

On page 1 of the Amendment of March 16, 2006, the applicants requested that the Amendment After Final Rejection of February 7, 2006, not be entered. However, the image file wrapper of the application still indicates that the Amendment After Final Rejection of February 7, 2006, is to be entered. It is respectfully requested that the Examiner have the image file wrapper of the application corrected to indicate that the Amendment After Final Rejection of February 7, 2006, is not to be entered.

Request for Acceptance of Replacement Sheets of Drawings Filed on March 16, 2006

Four replacement sheets of drawings were filed with the Amendment of March 16, 2006, but the Office Action of May 2, 2006, does not indicate whether these replacement sheets of drawings have been accepted. Accordingly, it is respectfully requested that the Examiner indicate whether these replacement sheets of drawings have been accepted in the next Office Action.

Claim Rejections Under 35 USC 103

Claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25, and 29 were rejected under 35 USC 103(a) as being unpatentable over Chow (U.S. Patent No. 5,157,240) in view of Chandler (U.S. Patent No. 2,799,764) or Isaacson et al. (U.S. Patent No. 3,842,241). This rejection is respectfully traversed.

Claims 1 and 23-24

It is submitted that Chow, Chandler, and Isaacson do not disclose "a heat-resistant layer formed on a surface of the cover heater" as recited in independent claim 1, or "a heat-resistant layer on the surface of the body heater" as recited in dependent claim 23.

The Examiner considers protective layer 25' of cover 11 in Figs. 2 and 4 of Chow to be "a heat-resistant layer formed on a surface of the cover heater" as recited in claim 1. Chow's protective layer 25' is described in column 5, lines 46-48, of Chow which reads as follows:

Again, a pyrolytic boron nitride outer protective layer, 25', covers the structure shown therebelow in FIGS. 2 and 4.

The purpose of Chow's protective layer 25' is described in column 6, lines 29-35, of Chow which reads as follows:

Also, the covering of heating elements 22' and 24' by protective layer 25' keeps them from being exposed directly to the substrate on which thin films are being deposited. This avoids the incorporation into the films being deposited of contaminants arising from the heating of these heating elements.

However, nothing in the above passages of Chow indicates that Chow's protective layer 25' is "a heat-resistant layer" as recited in claim 1 as alleged by the Examiner.

The Examiner considers protective layer 25 that covers the body heater as shown in Figs. 1-3 and 7 of Chow to be "a heat-resistant layer on the surface of the body heater" as recited in claim 23. Chow's protective layer 25 and its purposed are described in column 4, line 60, through column 5, line 3, of Chow which reads as follows:

All of this structure on the outer side of shell 20 is then finally covered by a protective layer, 25, of pyrolytic boron nitride, again deposited using a well known chemical vapor deposition process to a thickness of 1.0 to a few mils. Protective layer 25 prevents outer conductor 24 therebeneath from adsorbing gaseous impurities when out in the open which could later outgas at the crucible operating temperatures. Further, the pyrolytic graphite in outer heater 24, in the absence of protective layer 25, may react with residual molecules occurring thereabout even after a hard vacuum has been pulled therein.

However, nothing in the above passage of Chow indicates that protective layer 25 is "a heat-resistant layer" as recited in claim 23 as alleged by the Examiner.

In response to arguments with respect to claims 1 and 23 presented in the Amendment of March 16, 2006, the Examiner states as follows in the Office Action of May 2, 2006:

With respect to Chow, the applicant argues that since the layer 25' of Chow is disclosed as a protective layer and not as a "heat-resistant layer" as recited in the claims, Chow does not meet the recited claims. The applicant further argues that since the applicant does not neither claim nor disclose that the "heat-resistant layer" is made of pyrolytic boron nitride and is 1.0 to few mils thick as shown in Chow, the recited "heat-resistant layer" is not the same as that the protective layer of Chow. The applicant's arguments are not deemed persuasive. According to the applicant's disclosure, a "heat-resistant layer" is a layer that is formed as a "thin film type" (page 7, paragraph 35). Thus, the layer 25' of Chow, which is formed of a few mills, would meet such the applicant's definition of the "heat-resistant layer". It is also noted that Chow clearly shows the layer 25' (or 25) that is provided on the surface of the cover heater as well as on the surface of the body heater.

However, paragraph [0035] on page 7 of the applicants' disclosure does not define a "heat-resistant layer" as a layer that is formed as a "thin film type" as alleged by the Examiner. Rather, paragraph [0035], which was amended on page 3 of the Amendment of September 7, 2005, reads as follows in pertinent part:

As is more apparent from FIG. 4B, the heat-resistant layer 46, which is formed above the cover heater 43, is formed as a thin film type on the cover body 41.

This passage merely states that the heat-resistant layer 46 is formed as a thin film type, meaning a thin film type heat-resistant layer, and thus merely gives one example of the heat-resistant layer 46. The Examiner has apparently misinterpreted this passage as defining a "heat-resistant layer" to be any layer that is formed as a "thin film type." Based on this apparent misinterpretation, the Examiner has concluded that Chow's protective layer 25' which has a thickness of 1.0 to a few mils is a "heat-resistant layer." However, if the Examiner's position is correct, then a thin layer of any material, such as frozen hydrogen, water, liquid sodium, or aluminum, would also be a "heat-resistant layer" merely by reason of being thin, regardless of whether the thin layer actually has a heat-resistant property. Accordingly, it is submitted that the Examiner's position is both incorrect and unreasonable because it effectively ignores the limitation "heat-resistant" in the term "heat-resistant layer."

It is submitted that in order for Chow's protective layer 25' to be "a heat-resistant layer formed on a surface of the cover heater" as recited in claim 1 and for Chow's protective layer 25 to be "a heat-resistant layer on the surface of the body heater" as recited in claim 23, the Examiner is required to show that Chow's protective layers 25' and 25 are in fact "heat-resistant layers." However, it is submitted that the Examiner has not made such a showing.

It is submitted that Chow, Chandler, and Isaacson do not disclose or suggest "a reflective layer between the cover heater and the heat-resistant layer" as recited in claim 1, or "a reflective layer between the body heater and the heat-resistant layer" as recited in claim 24.

As recognized by the Examiner, Chow does not disclose "a reflective layer between the cover heater and the heat-resistant layer" as recited in claim 1, or "a reflective layer between the body heater and the heat-resistant layer" as recited in claim 24. However, the Examiner considers these features to be disclosed by Chandler and Isaacson, and is of the opinion that it would have been obvious to incorporate these features of Chandler and Isaacson into Chow's device "to reflect the heat generated by the heater toward an intended heating direction."

With respect to Chandler, the Examiner considers Fig. 5 of Chandler to show that "the heating element (72) is provided on a heating surface (76) with a heat reflecting layer (62) disposed between the heating element and a heat resistant/insulating layer (78)."

However, as described in column 7, lines 35-38, of Chandler, layer 78 is "a backing layer 78 of paper, paperboard, cloth, or other suitable material," rather than being "a heat resistant/insulating layer" as alleged by the Examiner or a "heat-resistant layer" as recited in claims 1 and 24. Fig. 5 of Chandler does show an insulating layer 68, but this insulating layer 68 is between heating element 72 and heat reflecting layer 62, and is an electrical insulating layer as described in column 7, lines 5-9, of Chandler, not a "heat-resistant layer" as recited in claims 1 and 24, such that Chandler does not disclose "a reflective layer between the cover heater and the heat-resistant layer" as recited in claim 1, or "a reflective layer between the body heater and the heat-resistant layer" as recited in claim 24.

With respect to Isaacson, the Examiner considers Figs. 2-3 of Isaacson to show "a heating surface (14) upon which a heating element (50) provided thereto with a heat reflective layer (56) disposed between the heating element and a heat resistant layer (40)."

However as described in column 2, lines 46-48, of Isaacson, element 40 is "a holder 40 which may be in the form of a picture frame holder and constructed of plastic," rather than being "a heat resistant layer" as alleged by the Examiner or a "heat-resistant layer" as recited in claims 1 and 24. Figs. 1-2 of Isaacson do show a thermal insulating board 52, but this thermal insulating board 52 is between heating element 50 and heat reflective layer 56, such that Isaacson does not disclose "a reflective layer between the cover heater and the heat-resistant layer" as recited in claim 1, or "a reflective layer between the body heater and the heat-resistant layer" as recited in claim 24.

The above arguments were also presented in the Amendment of March 16, 2006. In response to these arguments, the Examiner states as follows in the Office Action of May 2, 2006:

With respect to Chandler, the applicant argues the layer 78 which is disclosed as a paper, paperboard, cloth, or other suitable material is not the recited heat-resistant layer. This argument is not deemed persuasive since there is no reason why this layer cannot be served as a heat-resistant layer. A layer that impedes a heat transfer maybe considered as a heat-resistant layer, and the applicant has not disclosed that such material would be contrary to the applicant's definition of the heat-resistant layer. Likewise, with respect to Isaacson, the applicant argues the layer 40 which is disclosed as a holder constructed of plastic, is not the heat-resistant layer. But this argument is not persuasive since there is no reason why this layer cannot be a heat-resistant layer as it provides the support and protection to the heater.

In both Chandler and Isaacson, a reflective layer is provided between a heater and a heat-resistant layer such heat is directed toward the direction of heater and away from the heat-resistant layer. Therefore, it would have been obvious to one of ordinary skill in the art to further adapt Chow with a reflective layer between the heater and the heat-resistant layer so that heat is directed toward the heater which is the desired heat direction.

Thus, the Examiner has taken the position that "a layer that impedes a heat transfer may be considered as a heat-resistant layer," and, based on that position, has concluded that Chandler's backing layer 78 of paper, paperboard, cloth, or other suitable material and Isaacson's holder 40 constructed of plastic are "a heat-resistant layer." However, it is not seen where Chandler and Isaacson disclose that Chandler's backing layer 78 and Isaacson's holder 40 impede a heat transfer as would be required for them to be "a heat-resistant layer" in accordance with the Examiner's definition of that term. Nor has the Examiner shown that

Chandler's backing layer 78 and Isaacson's holder 40 impede a heat transfer. Nor would it be correct or reasonable for the Examiner to take the position that any layer made of any material may be considered to be a "heat-resistant layer" because it impedes a heat transfer in some fashion because such an interpretation would effectively ignore the limitation "heat-resistant" in the term "heat-resistant layer."

Furthermore, with respect to the Examiner's statement that "the applicant has not disclosed that such material [the paper, paperboard, cloth, or other suitable material of which Chandler's backing layer 78 is made] would be contrary to the applicants' definition of the heat-resistant layer," the Examiner's position seems to be that since the applicant has not disclosed that the "heat-resistant layer" recited in claims 1 and 24 cannot be made of paper, paperboard, cloth, or other suitable material, then the Examiner is free to consider Chandler's backing layer 78 of paper, paperboard, cloth, or other suitable material to be a "heat-resistant layer" as recited in claims 1 and 24. However, it is submitted that nothing whatsoever in the statutes, rules, procedures, or case law requires an applicant to disclose all possible materials which cannot be used to make an element of the applicants' invention as seems to be implied by the Examiner's apparent position.

Claims 2 and 18

It is submitted that Chow, Chandler, and Isaacson do not disclose the feature now recited in claim 2 "wherein the entire cover heater is constituted by a single wire pattern formed over the entire top surface of the cover, the single wire pattern of the entire cover heater having a positive terminal at a first end of the single wire pattern and a negative terminal at a second end of the single wire pattern," or the feature now recited in claim 18 "wherein the entire body heater is constituted by a single wire pattern formed over at least the entire outer side wall of the main body, the single wire pattern of the entire body heater having a positive terminal at a first end of the single wire pattern and a negative terminal at a second end of the single wire pattern," because the entire cover heater and the entire body heater in all of the embodiments disclosed in Chow are constituted by two heating element patterns, rather than being constituted by a single wire pattern as recited in claims 2 and 18. See inner heating element 22' and outer heating element 24' in Figs. 2 and 4 of Chow which show more detailed views of cover 11 in Fig. 1 of Chow, and inner heating element 22" and outer heating element 24" in cover 11' in Fig. 7 of

Chow. See first layer heating element 22 and second layer heating element 24 in Figs. 1-3 and 7 of Chow.

Claims 7 and 25

It is submitted that Chow, Chandler, and Isaacson do not disclose the feature of claim 7 "wherein the insulating material forming the cover has a good heat radiation property," or the feature of claim 25 "wherein the insulating material forming the main body has a good heat radiation property."

Chow's cover 11 or 11' and main body 20 are formed of pyrolytic boron nitride which appears to be an electrical insulating material in light of column 3, lines 46-49, of Chow. However, it is submitted Chow, Chandler, and Isaacson do not disclose or suggest that pyrolytic boron nitride "has a good heat radiation property" as recited in claims 7 and 25. Nor has the Examiner shown that pyrolytic boron nitride "has a good heat radiation property" as recited in claims 7 and 25.

In response to arguments with respect to claims 7 and 25 presented in the Amendment of March 16, 2006, the Examiner states as follows in the Office Action of May 2, 2006:

With respect to claims 7 and 25, the applicant argues that since the recited insulating materials do not recite that they are made of pyrolytic boron nitride as shown in Chow, claims 7 and 25 are not met by Chow. It is noted that the claim recite the insulating material has a good heat radiation property. The recited property can be met if the recited material is made of the same material as that of the claimed material. The claimed material in this case is an "insulating" material. There is no other claim recitation that distinguishes this material other than being an "insulating" material. Thus, Chow having an "insulating" material would meet such property. Again, there is no other claimed limitation that would distinguish the claimed "insulating material" from that of the applied prior art Chow.

However, contrary to the Examiner's assertions that "[t]here is no other claim recitation that distinguishes this material other than being an 'insulating' material" and "[t]here is no other claimed limitation that would distinguish the claimed 'insulating material' from that of the applied prior art Chow," it is submitted that there is in fact a claimed limitation that distinguishes the "insulating material" recited in claims 7 and 25 from the pyrolytic boron nitride disclosed in

Chow—the limitation in claims 7 and 25 that the insulating material "has a good heat radiation property."

The Examiner's position seems to be that any insulating material has a good heat radiation property, and since Chow's pyrolytic boron nitride is an "insulating material" as recited in claims 7 and 25, it also "has a good heat radiation property" as recited in claims 7 and 25. However, it is submitted that the Examiner's apparent position is both incorrect and unreasonable because there are many different insulating materials having different heat radiation properties known in the art. In general, some of these different insulating materials have a poor heat radiation property, others have a moderate heat radiation property, and still others have a good heat radiation property. In the applicants' invention as recited in claims 7 and 25, the insulating material "has a good heat radiation property." In contrast, Chow does not disclose that pyrolytic boron nitride "has a good radiation property" as recited in claims 7 and 25, and in fact contains no discussion whatsoever relating to a heat radiation property of pyrolytic boron nitride. Nor has the Examiner shown that pyrolytic boron nitride "has a good heat radiation property" as recited in claims 7 and 25. Nor is it seen where this feature of claims 7 and 25 is disclosed or suggested by Chandler and Isaacson.

Claim 9

As recognized by the Examiner, Chow, Chandler, and Isaacson do not disclose the feature of claim 9 "wherein the cover heater is formed in a concentric pattern around the nozzle." However, the Examiner is of the opinion that it would have been obvious to modify Chow's cover heater to have this feature, stating as follows:

With respect to claim 9, Chow shows the cover having a nozzle in the center of the cover with a cover heater provided around the nozzle. However, while, Chow does not show that the cover heater concentric pattern around the nozzle, it would have been obvious to one of ordinary skill in the art to provide the cover heater in the concentric pattern or any other pattern to affectively provide uniform and stable heating across the cover.

In response to arguments with respect to claim 9 presented in the Amendment of March 16, 2006, the Examiner states as follows in the Office Action of May 2, 2006:

With respect to claim 9, the applicant argues that the examiner has not provided the motivation to modify the Chow's cover heater to be "formed in a concentric pattern around the nozzle". This argument is not deemed persuasive. Chow discloses that it is important to provide a good uniform heat distribution to avoid hot and cold zones (see column 1, lines 60-68) and this would have been the motivation to provide the heating pattern in the concentric pattern. Chow shows a heating wire that encircles a hole or nozzle, and to one of ordinary skill in the art, it would have been obvious to modify the heating pattern in a concentric pattern or any other pattern that would have provided a good uniform heating so that vaporization out of the nozzle is evenly heated. It is also noted that the applicant allows other forms of heating pattern other than a concentric pattern (paragraph 31).

The Examiner is apparently referring to the embodiment in Fig. 7 of Chow which has a single aperture 19' in a central portion of a cover 11' having a cover heater constituted by an inner heating element 22" and an outer heating element 24" separated by an insulating layer 23". The arrangement of the inner heating element 22" and the outer heating element 24" is described as follows in column 6, lines 54-58, of Chow:

Heating elements 22" and 24" are not shown mostly perpendicular with respect to each other as in FIGS. 2 and 4 but, instead, are mostly parallel to each other with one being mostly positioned in the gaps between adjacent portions of the other.

However, it is not seen how this passage of Chow can be considered to disclose or suggest that heating elements 22" and 24" either are formed or may be formed "in a concentric pattern around the nozzle [the single aperture 19']" as recited in claim 19. Nor is it seen how the teaching that "it is important to provide a good uniform heat distribution to avoid hot and cold zones" in column 1, lines 60-68, of Chow referred to by the Examiner can be considered to disclose or suggest that heating elements 22" and 24" either are formed or may be formed "in a concentric pattern around the nozzle [the single aperture 19']" as recited in claim 19, particularly in light of the fact that Chow discloses non-concentric patterns that provide a good uniform heat distribution (see, for example, Figs. 1-2 and 4 of Chow).

With respect to the Examiner's statement that "[i]t is also noted that the applicant allows other forms of heating pattern other than a concentric pattern (paragraph 31)," it is submitted that the Examiner is expressly prohibited by MPEP 2143 from relying on statements in the applicants' disclosure as a source of motivation to form Chow's heating patterns 22" and 24" "in

a concentric pattern around the nozzle [the single aperture 19]" as recited in claim 19. MPEP 2143 (see page 2100-135 of the MPEP) provides as follows (emphasis by underlining added):

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. (Citation omitted.)

Here, it is submitted that the Examiner has not identified any motivation whatsoever in Chow, Chandler, and Isaacson or elsewhere in the prior art to modify Chow's heating elements 22" and 24" to be "formed in a concentric pattern around the nozzle [the single aperture 19]" as recited in claim 9, such that the Examiner has not established a *prima facie* case of obviousness with respect to claim 9 pursuant to MPEP 2143.

Claim 16

It is submitted that Chow, Chandler, and Isaacson do not disclose or suggest the features now recited in claim "wherein the cover heater is constituted by a sprayed heating block on the cover; and wherein the sprayed heating block is constituted by a sprayed heat emitting material on the cover."

In response to arguments with respect to claim 16 presented in the Amendment of March 16, 2006, the Examiner states as follows in the Office Action of May 2, 2006:

With respect to claim 16, the applicant argues that the examiner did not discuss the feature of claim 16 in explaining the rejection. In the office action mailed on 11/17/05, in the response to argument section, it was explained that the claim 16 is a product by process claim wherein the patentability of an apparatus is defined by the product itself and not by the process by which it is made. In claim 16, the cover heater is made by the process of spray coating a heat emitting material on the cover. On page 3, paragraph 3 of the office action, in the ground of rejection, it is

stated that Chow shows "a cover heater is formed as thin film on a top surface of the cover...". This meets the recited the structure of the "heat emitting material on the cover" which form a heating block or a heater.

However, claim 16 has now been amended so that it is no longer a product-by-process claim, such that the Examiner's comments are no longer applicable to claim 16.

Chow's cover heater is constituted by the inner heating element 22' or 22", the insulating layer 23' or 23", and the outer heating element 24' or 24" and is apparently formed the same way that Chow's body heater is formed. Chow's body heater is formed by depositing pyrolytic graphite on the shell 20 by chemical vapor deposition, selectively masking the resulting graphite surface, and etching away the unmasked portions to form the first layer heating element 22; depositing pyrolytic boron nitride on the first layer heating element 22 to form the insulating layer 23; and depositing pyrolytic graphite on the shell insulating layer 23 by chemical vapor deposition, selectively masking the resulting graphite surface, and etching away the unmasked portions to form the second layer heating element 22. See column 3, line 24, through column 4, line 5, of Chow which describes the process of forming Chow's body heater. Thus, Chow's cover heater constituted by the inner heating element 22' or 22", the insulating layer 23' or 23", and the outer heating element 24' or 24" is not "constituted by a sprayed heating block on the cover" as recited in claim 16, and is not "constituted by a sprayed heat emitting material on the cover" as recited in claim 16.

Furthermore, it is submitted that Chow's cover heater is not a "heating block" as recited in claim 16 because Chow's cover heater is constituted by the inner heating element 22' or 22", the insulating layer 23' or 23", and the outer heating element 24' or 24," and thus is formed by two separate heating elements arranged in two layers, rather than being a "heating block" as recited in claim 16.

Claim 20

It is submitted that Chow, Chandler, and Isaacson do not disclose or suggest the feature now recited in claim 20 "wherein the single wire pattern of the body heater is further formed on the entire outer bottom wall of the main body."

In response to arguments with respect to claim 20 presented in the Amendment of March 16, 2006, the Examiner states as follows in the Office Action of May 2, 2006:

With respect to claim 20, the applicant argues that the body heater is formed over the sides of the main body and not over the bottom of the main body. Chow shows a main body having a bottom which is the bottom portion of the main body (10) wherein a body heater is formed over the bottom. As shown by Figure 2, the body heater formed along the side of the main body over or above the bottom of the main body. This clearly meets the claim recitation.

Although this passage is not entirely clear, it appears that the Examiner is interpreting the word "over" in the phrase "over the bottom of the main body" that previously appeared in claim 20 to mean "in or at a position above or higher than," rather than to mean "upon the surface of," which was the meaning intended by the applicants. In any event, claim 20 has been amended to recite that "the single wire pattern of the body heater is further formed on the entire outer bottom wall of the main body," and it is readily apparent from Fig. 2 of Chow that the first layer heating element 22 and the second heating layer element 24 are formed only on the outer side wall of the shell 20, and are not further formed on the outer bottom wall of the shell 20.

Claim 29

It is submitted that Chow, Chandler, and Isaacson do not disclose or suggest the features of claim 29 "wherein the cover heater is a single-layer cover heater; and wherein the body heater is a single-layer body heater" because Chow's cover heater is a three-layer cover heater constituted by the inner heating element 22' or 22", the insulating layer 23' or 23", and the outer heating element 24' or 24", and Chow's body heater is a three-layer body heater constituted by the first layer heating element 22, the insulating layer 23, and the second layer heating element 24. Claim 29 was newly added in the Amendment of March 16, 2006, and arguments substantially the same as the above arguments were presented on page 28 of the Amendment of March 16, 2006, but the Examiner did not respond to these arguments in the Office Action of May 2, 2006. Rather, the Examiner merely added claim 29 to the rejection of claims 1, 2, 4, 7, 9, 11-13, 16-18, and 20-25 under 35 USC 103(a) as being unpatentable over Chow in view of Chandler or Isaacson without providing an explanation of the rejection of claim 29 or otherwise addressing the features recited in claim 29.

Claims 4, 11-13, 17, and 21-22

It is submitted that claims 4, 11-13, 17, and 21-22 which depend directly or indirectly from claim 1 are patentable over Chow, Chandler, and Isaacson for at least the same reasons that claim 1 is patentable over Chow, Chandler, and Isaacson as discussed above.

Conclusion—Rejection 1

For at least the foregoing reasons, it is respectfully requested that the rejection of claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25, and 29 under 35 USC 103(a) as being unpatentable over Chow in view of Chandler or Isaacson be withdrawn.

Rejection 2

Claims 3, 14, and 19 were rejected under 35 USC 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25, and 29, and further in view of Kano et al. (Kano) (U.S. Patent No. 6,242,719). This rejection is respectfully traversed.

It is submitted that claims 3, 14, and 19 which depend directly or indirectly from various ones of claims 1, 2, and 18 are patentable over Chow, Chandler, Isaacson, and Kano for at least the same reasons that claims 1, 2, and 18 are patentable over Chow, Chandler, and Isaacson as discussed above. Accordingly, it is respectfully requested that the rejection of claims 3, 14, and 19 under 35 USC 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25, and 29, and further in view of Kano be withdrawn.

Rejection 3

Claims 8, 15, and 26 were rejected under 35 USC 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25, and

29, and further in view of Bichrt (U.S. Patent No. 6,162,300). This rejection is respectfully traversed.

It is submitted that claims 8, 15, and 26 which depend directly or indirectly from various ones of claims 1, 7, and 25 are patentable over Chow, Chandler, Isaacson, and Bichrt for at least the same reasons that claims 1, 7, and 25 are patentable over Chow, Chandler, and Isaacson as discussed above. Accordingly, it is respectfully requested that the rejection of claims 8, 15, and 26 under 35 USC 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25, and 29, and further in view of Bichrt be withdrawn.

Rejection 4

Claim 10 was rejected under 35 USC 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25, and 29, and further in view of Okuda et al. (Okuda) (U.S. Patent No. 4,804,823). This rejection is respectfully traversed.

It is submitted that Chow, Chandler, Isaacson, and Okuda do not disclose or suggest the features of claim 10 "wherein the cover heater is constituted by a sintered printed conductive paste on the cover; and wherein the conductive paste comprises metal particles and metal oxide."

As recognized by the Examiner, Chow, Chandler, and Isaacson do not disclose or suggest the features of claim 10 "wherein the cover heater is constituted by a sintered printed conductive paste on the cover; and wherein the conductive paste comprises metal particles and metal oxide." However, the Examiner considers these features of claim 10 to be disclosed by Okuda, and is of the opinion that it would have been obvious to incorporate these features into Chow's device "to adapt Chow, as modified by Chandler or Isaacson, with the cover heater made of conductive paste having the metal particles and metal oxides to form a heating element that can provide a mechanically and thermally stable heater that can also withstand a high temperature."

Although the Examiner did not identify any particular portion of Okuda as support for the rejection, the most relevant passages of Okuda appear to be column 5, lines 26-30, of Okuda which reads as follows:

The heat-generating generator layer containing TiN is formed of a sintered body of (a) titanium nitride, (b) silicon nitride and (c) a sintering aid. As the sintering aid (c), there are used yttria, magnesia and alumina. An especially preferred example of the ceramic composition comprises 40 to 85% by weight of titanium nitride, 20 to 54% by weight of silicon nitride and 1 to 10% by weight of the sintering aid.

and column 6, line 54, through column 7, line 4, of Okuda which reads as follows:

In accordance with still another embodiment of the present invention, the ceramic substrate is composed of a sintered body of silicon nitride and the heat-generating resistor is composed of a tungsten carbide layer. The heat-generating resistor layer of WC is prepared, for example, by sintering a paste containing WC alone.

In the examples of the present invention, the heat-generating resistor paste comprising substantially pure WC, that is, WC having a purity of 99.8%, was used. However, in order to adjust the resistance value of the heat-generating resistor, improve the denseness of the resistor or enhance the bondability to the silicon nitride substrate, up to about 40% by weight of a single substrate, oxide, nitride, carbide or carbonitride of an element of the group IIIA such as Y or an element of the group IIa such as Mg, or the same Si_3N_4 as that of the silicon nitride substrate, may be added to WC. If such an additive is incorporated, the effects of the present invention are not degraded.

Tables 1, 3-4, and 8 in Okuda disclose various examples of the conductive pastes described in above portions of Okuda.

However, it is submitted that Okuda does not disclose or suggest the feature of claim 10 "wherein the conductive paste comprises metal particles and metal oxide" because all of the conductive pastes described in the above portions of Okuda and shown in Tables 1, 3-4, and 8 of Okuda comprise metal nitride particles (TiN) or metal carbide particles (WC) and metal oxide (yttria, magnesia, alumina), rather than "metal particles and metal oxide" as recited in claim 10.

Although Tables 2 and 8 of Okuda disclose conductive pastes that comprise "metal particles" (Mo or W) as recited in claim 10, these conductive pastes do not comprise "metal

oxide" as recited in claim 10 as can be seen, for example, from column 8, lines 49-51; column 9, lines 67-68; column 13, lines 1-6; and column 15, lines 59-60, of Okuda.

The above arguments were also presented in the amendment of September 7, 2005. In response to these arguments, the Examiner states as follows in the Office Action of November 17, 2005:

With respect to claim 10, . . . the recited elements are met under Okuda which clearly shows yttria or magnesia or alumina which are known as metal oxides.

However, the Examiner has apparently missed the point of the applicants' arguments. The applicants are not disputing that Okuda discloses "metal oxide" as recited in claim 10. However, claim 10 does not recite only "metal oxide." Rather, claim 10 recites that "the conductive paste comprises metal particles and metal oxide." The point of the applicants' arguments is that Okuda does not disclose this combination of "metal particles and metal oxides" recited in claim 10. Rather, Okuda discloses examples in which a conductive paste comprises the combination of metal nitride particles (TiN) and metal oxide, examples in which a conductive paste comprises the combination of metal carbide particles (WC) and metal oxide, and examples in which a conductive paste comprises only metal particles (either Mo or W). However, Okuda does not disclose a conductive paste which comprises the combination of "metal particles and metal oxides" recited in claim 10.

The above arguments were also presented in the Amendment of March 16, 2006. In response to these arguments, the Examiner states as follows in the Office Action of May 2, 2006:

With respect to Okuda, the applicant argues there is no showing of the metal particles and metal oxides. Okuda teaches that the conductive paste is made with metal powders which meet the claimed metal particles (see Examples of Okuda).

However, as already explained in the Amendment of March 16, 2002, as indicated above, the Examples of Okuda referred to by the Examiner include examples in which a conductive paste comprises the combination of metal nitride particles (TiN) and metal oxide, examples in which a conductive paste comprises the combination of metal carbide particles (WC) and metal oxide, and examples in which a conductive paste comprises only metal particles (either Mo or W). However, Okuda does not disclose a conductive paste which comprises the

combination of "metal particles and metal oxides" recited in claim 10, it being noted that the metal nitride particles (TiN) and the metal carbide particles (WC) disclosed in Okuda are not "metal particles" as recited in claim 10. Should the Examiner repeat this rejection, it is respectfully requested that the Examiner specifically point out one of the Examples of Okuda that includes a combination of "metal particles and metal oxides" as recited in claim 10.

For at least the foregoing reasons, it is respectfully requested that the rejection of claim 10 under 35 USC 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25, and 29, and further in view of Okuda be withdrawn.

Rejection 5

Claims 27-28 were rejected under 35 USC 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25, and 29, and further in view of Chen et al. (Chen) (U.S. Patent No. 6,024,799) or Murakami et al. (Murakami) (U.S. Patent No. 5,728,223). This rejection is respectfully traversed.

Claim 27

It is submitted that Chow, Chandler, Isaacson, Chen, and Murakami do not disclose or suggest the features of claim 27 "wherein the nozzle is a convergent-divergent nozzle through which the gaseous organic substance comes out from the main body in a diverging pattern, thereby enabling the heating crucible to produce a diverging pattern of the gaseous organic substance" as recited in claim 27.

It is noted that the Examiner did not address these features of claim 27 in their entirety in explaining the rejection of claim 27 in the Office Action of May 2, 2006. Rather, the only portion of these features that the Examiner addressed is the "convergent-divergent nozzle."

As recognized by the Examiner, Chow, Chandler, and Isaacson do not disclose "a convergent-divergent nozzle" as recited in claim 27. However, the Examiner considers Chen and Murakami to disclose a convergent-divergent nozzle, and is of the opinion that it would be have been obvious to modify the combination of Chow and Chandler or Isaacson to use the

convergent-divergent nozzle of Chen or Murakami "to provide a more defined outlet gas flow for even distribution of the vapor deposition."

However, the Examiner has not identified where Chen and Murakami disclose that the convergent-divergent nozzle is "a convergent-divergent nozzle through which the gaseous organic substance comes out from the main body in a diverging pattern, thereby enabling the heating crucible to produce a diverging pattern of the gaseous organic substance" as recited in claim 27.

Furthermore, assuming *arguendo* that Chen and Murakami disclose a convergent-divergent nozzle that produces "a diverging pattern" as recited in claim 27, it is submitted that it would not have been obvious to use this convergent-divergent nozzle in the combination of Chow and Chandler or Isaacson as proposed by the Examiner because Figs. 5-6 and column 6, lines 36-50, of Chow disclose that Chow's crucible 10 produces a converging material beam, and column 6, line 66, through column 7, line 5, of Chow discloses that the single aperture 19' in Fig. 7 "can also provide material beam directivity," apparently meaning a converging material beam in light of column 6, lines 36-50, of Chow referred to above and in light of column 2, lines 14-16, of Chow which states that "[t]here is desire for a source which can provide a material beam displaying good directivity." It is submitted that one of ordinary skill in the art would understand the phrases "material beam directivity" and "a material beam displaying a good directivity" to mean a converging material beam.

The Examiner's attention is directed to MPEP 2143.01(V) (see page 2100-137 of the MPEP) which provides as follows in pertinent part (emphasis added):

**V. THE PROPOSED MODIFICATION CANNOT RENDER
THE PRIOR ART UNSATISFACTORY FOR ITS
INTENDED PURPOSE**

If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. [Citation omitted.]

Here, as discussed above, one of the intended purposes of Chow's crucible 10 is to produce a converging material beam. Assuming *arguendo* that Chen and Murakami disclose a divergent-convergent nozzle that produces "a diverging pattern" as recited in claim 27, using this convergent-divergent nozzle in Chow as proposed by the Examiner would produce a diverging

material beam, thereby rendering Chow's crucible 10 unsuitable for its intended purpose of producing a converging material beam. Accordingly, pursuant to MPEP 2143.01(V), it is submitted that there is no suggestion or motivation to modify Chow's crucible 10 to use Chen and Murakami's convergent-divergent nozzle, such that the Examiner has not established a *prima facie* case of obviousness with respect to claim 27.

Claim 28

It is submitted that Chow, Chandler, Isaacson, Chen, and Murakami do not disclose or suggest the features of claim 28 "wherein the nozzle extends from a surface of the cover facing toward the main body to a surface of the heat-resistant layer facing away from the main body; wherein an entry opening of the nozzle through which the gaseous organic substance enters the nozzle is flush with the surface of the cover facing toward the main body; wherein an exit opening of the nozzle through which the gaseous organic substance exits from the nozzle is flush with the surface of the heat-resistant layer facing away from the main body; and wherein the nozzle converges from the entry opening to a throat of the nozzle at a junction between the cover and the heat-resistant layer, and diverges from the throat of the nozzle to the exit opening."

It is noted that the Examiner did not address these features of claim 28 in their entirety in explaining the rejection of claim 28 in the Office Action of May 2, 2006. Rather, the only portion of these features that the Examiner addressed is the "convergent-divergent nozzle."

As recognized by the Examiner, Chow, Chandler, and Isaacson do not disclose "a convergent-divergent nozzle" as recited in claim 28. However, the Examiner considers Chen and Murakami to disclose a convergent-divergent nozzle, and is of the opinion that it would be have been obvious to modify the combination of Chow and Chandler or Isaacson to use the convergent-divergent nozzle of Chen or Murakami "to provide a more defined outlet gas flow for even distribution of the vapor deposition."

However, all of the convergent-divergent nozzles disclosed in Chen and Murakami are formed in a solid block of material that has no layers, such that Chen and Murakami do not disclose or suggest the feature of claim 28 "wherein the nozzle converges from the entry

opening to a throat of the nozzle at a junction between the cover and the heat-resistant layer, and diverges from the throat of the nozzle to the exit opening."

Conclusion—Claims 27-28

For at least the reasons discussed above, it is respectfully requested that the rejection of claims 27-28 under 35 USC 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25, and 29, and further in view of Chen or Murakami be withdrawn.

New Claims 30-31

It is submitted that Chow, Chandler, Isaacson, Kano, Bichrt, and Okuda do not disclose or suggest the features of new claim 30 depending from claim 29 "wherein the single-layer cover heater is the only cover heater on the cover; and wherein the single-layer body heater is the only body heater on the main body" because Chow's cover heater is a three-layer cover heater constituted by the inner heating element 22' or 22", the insulating layer 23' or 23", and the outer heating element 24' or 24", and Chow's body heater is a three-layer body heater constituted by the first layer heating element 22, the insulating layer 23, and the second layer heating element 24.

It is submitted that Chow, Chandler, Isaacson, Kano, Bichrt, and Okuda do not disclose or suggest the features of new claim 31 depending from claim 1 "wherein the heat-resistant layer blocks heat generated by the cover heater from being transferred outside the heating crucible" because nothing whatsoever in Chow discloses or suggests that Chow's protective layer 25' or 25" blocks heat generated by the cover heater constituted by the inner heating element 22' or 22", the insulating layer 23' or 23", and the outer heating element 24' or 24" from being transmitted outside the crucible 10.

For at least the reasons discussed above, it is submitted that new claims 30-31 are patentable over Chow, Chandler, Isaacson, Kano, Bichrt, and Okuda, and an indication to that effect is respectfully requested.

Conclusion

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.


Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with the filing of this paper, please charge the same to our Deposit Account No. 503333.

Respectfully submitted,

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